

## VEHICLE LIFT

## TEXT OF DESCRIPTION

5 The present invention relates to vehicle lifts, in particular of the scissors type. In the following description, scissors-type lifts mean in general scissors- and double-scissors-type lifts, in which, when the scissors are closed, the lift is lowered to ground level, and when  
10 the scissors are open, the lift is raised, and inverted- and double-inverted-scissors-type lifts, in which the scissors open beneath ground level, in order to lower the lift, and are closed at ground level, in order to lower the lift, and are closed at ground level in order to raise the lift,  
15 optionally with the assistance of pistons or rack-type mechanisms.

The FR-A-1 575 128 discloses a scissors-type vehicle lift comprising a volumetric operating system in which two  
20 cylinders move a vehicle lifting runway. A main cylinder receives the operating fluid directly from supply means, and a secondary cylinder receives the operating fluid from the outlet of the main cylinder, whereby with the runway there is associated the main cylinder and the secondary cylinder.

25 Scissors-type lifts have been developed in which, in order to move the lift, a pair of cylinders is provided for each of the lifting scissors of the runways. The known operating system for the cylinders is of the serial type, i.e. in a  
30 first runway there are disposed the main cylinders, the outlet of which supplies the secondary cylinders which are associated with the other runway. This arrangement requires

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temporally staggered raising of the two runways, and thus gives rise to a loss of parallelism of the vehicle relative to the ground. In addition, the force on the pair of cylinders is asymmetrical, with all the resulting problems.

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The object of the present invention is thus to provide a volumetric operating system for vehicle lifts, in particular of the scissors type, which permits synchronized movement of the runways.

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This problem is solved remarkably well by means of a volumetric operating system according to claim 1, for vehicle lifts. Further advantageous characteristics of the said system are indicated in the dependent claims.

5 *44* The characteristics, objects and advantages of the present invention will become more apparent from the following description and from the attached drawings relative to a non-limiting embodiment. In the various  
10 figures:

Figure 1 is a schematic view of the volumetric operating system for lifts according to the prior art; and

Figure 2 is a schematic view of the volumetric operating system for lifts according to the present  
15 invention.

*44* With reference firstly to figure 1, a volumetric operating system 100 for scissors-type vehicle lifts has firstly two runways 112, 114. With each runway there is  
20 associated at least one pair of scissors (not shown), which is controlled by a respective pair of cylinders 116, 118 and 120, 122. Pressurised fluid, for example oil, air or liquid, is supplied via a valve 124 and two pipes 128 and 130 to the two cylinders 116 and 118 which are associated  
25 with the first runway 112. It will be appreciated that upstream from the valve 124, there are present the corresponding command and control components, which are not described in detail, since they are not relevant for the purposes of the present invention. Two pipes 132, 134  
30 supply respectively to the two cylinders 120, 122 which are associated with the second runway 114, the fluid output from the rod chamber of the cylinders 116, 118. In other words, the system 100 is of the serial type, in which, with the first runway 112 there are associated the main  
35 cylinders 116, 118, and with the second runway 114 there are associated the secondary cylinders 120, 122. However, since in a volumetric system the main cylinders tend to

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~~fill before the secondary cylinders, in the case of the~~  
 device in figure 1, the runway 112 tends to rise before the  
 runway 114. Consequently, the vehicle is not raised  
 perfectly parallel to the ground, and the force on the  
 5 pairs of cylinders is asymmetrical, with all the resulting  
 problems.

Figure 2 illustrates a volumetric operating system 10  
 according to the invention, for scissors-type vehicle  
 10 lifts, in which the components of the system 10 which  
 correspond to those of the system 100 in figure 1 have  
 corresponding reference numbers, but reduced by 100. Thus,  
 with each runway 12, 14, there is associated at least one  
 pair of scissors (not shown), which is controlled by a  
 15 respective pair of cylinders 16, 18 and 20, 22. However,  
 according to the present invention, the pressurised fluid  
 is supplied via a valve 24 and two pipes 28, 30, to the  
 cylinder 16 which is associated with the first runway 12,  
 and to the cylinder 22 which is associated with the second  
 20 runway 14. The outlet of the rod chamber of the cylinders  
 16, 22 is connected by means of two pipes 32, 34  
 respectively, to the cylinder 20 which is associated with  
 the second runway 14, and to the cylinder 18 which is  
 associated with the first runway 12. The system 10 is thus  
 25 of the cross-type, in which the main cylinders 16, 22 and  
 the secondary cylinders 18, 20 are associated, one with  
 each runway 12, 14. Consequently, according to the  
 invention, the two runways 12, 14 are raised simultaneously  
 with the filling of the main cylinders 16, 22, and the  
 30 temporal staggering of operation of the secondary cylinders  
 18, 20 does not have significant consequences on the  
 movement of the runways 12, 14. The vehicle is thus raised  
 in a manner which is perfectly parallel to the ground, and  
 the force on the pairs of cylinders which are associated  
 35 with the two runways is perfectly symmetrical.

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5 be obtained by providing a pair consisting of a main  
cylinder and a secondary cylinder associated for each  
runway. Finally, it will be apparent to persons skilled in  
the art that the design characteristics of the cylinders  
are irrelevant, provided that the main cylinders have an  
10 outlet for the fluid which can be used to supply the  
secondary cylinders. In addition, it will be appreciated  
that the basic principle of the invention can be extended  
to any number of pairs of cylinders, and it must thus be  
considered that numerous modifications, adaptations,  
15 integrations, variants and substitutions can be made to the  
embodiment previously described by way of illustrative,  
non-limiting example, without departing from the context of  
the invention, as determined by the following attached  
claims.

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